



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 8, Issue, 12, pp. 22187-22192, December, 2017

**International Journal of
Recent Scientific
Research**

DOI: 10.24327/IJRSR

Research Article

IMPLICIT RATIONING OF NURSING CARE AND ITS RELATIONSHIP WITH THE WORK ENVIRONMENT

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DOI: <http://dx.doi.org/10.24327/ijrsr.2017.0812.1218>

ARTICLE INFO

Article History:

Received 17th September, 2017

Received in revised form 12th

October, 2017

Accepted 04th November, 2017

Published online 28th December, 2017

Key Words:

Rationing of care, Nursing, Environment,
Nursing Personnel.

ABSTRACT

Objective. Determine the implicit rationing of nursing care and its relationship with the work environment. **Material and Methods.** Descriptive and Correlational, 205 nurses. Instruments: BERNCA & PES-NWI. **Results.** Element of rationed care was activities of daily life M=59.91 (SD=16.54). The contributing factor was foundations of nursing M=67.67 (SD=17.01). Factor, staffing and supply of resources with elements of rationed care in everyday activities. (rs=.158, p=.05), care and support (rs=.139, p=.05), rehabilitation, instruction and education (rs=.247, p=.01) and BERNCA index (rs=.244, p=.01). Nursing technician rations less the monitoring care and safety ($\chi^2=10.049$, p=.007). The contributing factor in the general nurse was foundations in nursing ($\chi^2=6.778$, =.034). General Surgery performs more daily life activities ($\chi^2=30.132$, p=.001); internal medicine more rehabilitation, instruction and education ($\chi^2=19.206$, p=.001). **Conclusions.** These results will enable us to establish improvement projects to strengthen the elements of rationed care.

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INTRODUCTION

Worldwide, thousands of patients are injured or die while receiving health care. The data from the World Health Organization (WHO) indicate that the incidents in the safety of hospitalized patients are produced between 4 and 16% of the patients. It also mentions that the most important thing in the safety of patients is managing to avoid damage during the treatment and attention. Likewise, the WHO points out that, based on the studies from Harvard's Institute of Medicine, it was reported that 4% of the patients suffer some form of damage while in the hospital, 70% of adverse events cause temporary disability and 14% of the incidents are fatal (OMS, 2007; OMS 2011).

Regarding this, nursing care could be affected when resources are in shortage or limited and nursing personnel are obligated to ration or omit care for patients using their clinical judgment to give priority to evaluations and interventions in patients with a more serious condition. In spite of the fact that health care is excellent in countries considered part of the first world, non intentional injuries still occur during hospitalization, as well as complications for patients, thus increasing the cost of health

(Bail & Grealish, 2016). When indispensable care is limited, the condition is known as rationed nursing care (Schubert *et al*, 2008).

Rationed nursing care was studied by Schubert *et al*. (2008), who identified that the risk in the quality and safety of the patient while receiving nursing care treatment or attention significantly decreased the patient's satisfaction. Consequently, rationed care generates adverse events. Among the most frequently mentioned by nurses are medication errors, falls, hospital infections, pressure ulcers and critical incidents.

Schubert *et al*. (2008) point out that the shortage of nursing personnel is associated with higher risk for the vulnerability of negative results in hospitalized patients receiving acute care and defines implicit rationing of nursing care as the "limitation of the necessary nursing measures for patients who lack nursing resources, among them, personnel, skills, time, work experience and seniority in the institution,. Rationed nursing care can be affected when there is shortage of resources or they are limited and nursing personnel feels obligated to ration or omit patient care (Kalish & Aebersold, 2010; Schubert *et al*, 2012).

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In this same context, rationed care has been linked to the work environment of nursing practice or work environment which, according to Lake (2002), is a factor that provides contributions and knowledge that nursing personnel can perform inside the hospital, for the improvement of the attention of nursing care, which has been observed as linked to the care nurses provide to patients.

This tool measures the nursing work environment; among the topics covered are: "Participation of nursing personnel in hospital issues", seeking to identify the opportunity nurses have to intervene in making decisions regarding hospital policies; "Foundations of nursing for the quality of care", relative to the existence of written care plans for each patient for the purpose of providing higher quality care (De Pedro *et al.*, 2009; Lake, 2002).

Likewise, "Aptitude, leadership and support to supervisors", related to the comprehensive role of the supervisors and their assistance tasks and support for the team; the "Staffing and supply of resources", which contemplates the sufficiency of graduate nurses to provide quality care and the "Relations among nursing personnel and medical personnel", relative to the relationship between doctors and nurses under the appropriate collaboration conditions (De Pedro *et al.*, 2009; Lake, 2002).

The Joint Commission International (JCI) considers that both the rationing of nursing care and the work environment are indicators of quality in the accreditation of hospitals. Likewise the American Nurses Credentialing Center (ANCC) includes them as indicators in the accreditation of magnet hospitals. (JCI, 2014; ANCC, 2015).

In Mexico, the quality and safety of the patient when he is receiving attention of his health is national priority, therefore all patients have the right to receive efficient and safe care with a minimum risk of exposure to bad practice, rationing or omission of care (WHO, 2007). The Model of the Council of General Health (CGS, 2015) for the Attention of Health with Quality and Safety is in charge of the Certification of medical hospitalization facilities, through basic actions for the safety of the patient, critical systems of attention centered in the patient and management of the organization. Regarding this, it is the responsibility of health professionals to promote a culture of quality and safety for the patient in the attention that impacts all processes and systems.

The studies that have been developed regarding implicit rationing of nursing care, report that rationed nursing care is more common in the hospitalized patient environment and is associated with negative results in the patients, such as adverse events, medication errors, hospital infections, mortality inside the hospital and lack of satisfaction in the patient. (Ausserhofer *et al.*, 2014). Other authors report a prevalence of rationed nursing care in 55% to 98% of patients, and report that nursing personnel do not completely carry out one or more activities of patient care (Jones *et al.*, 2016).

Additionally, rationed nursing care was studied and the objectives were: to identify the perceptions and reasons of rationed nursing care, the inefficient methods to determine the levels of staffing and the combination of capacities, including

the number of non-adequate personnel. The results found were able to identify that a greater demand from patients reduced attention time. These are some of the aspects for which nursing personnel overlook the attention of care. However, the authors mention that more research is required in the solution of rationed nursing care (Verrall *et al.*, 2015).

Papastavrou *et al.*, (2014) point out that rationed nursing care is the result of lack of resources and reduces the carrying out of all the necessary nursing measures. They mention that there is evidence of a link between rationed nursing care and the perception of nursing professionals, resulting in negative results in patients and the safety of a patient in situations of risk. They report that rationed nursing care and the work environment are related to the patient's level of satisfaction.

The nursing work environment was also investigated and it was found that there is a relationship between the work environment and the quality of care and patient's safety, and a statistically significant relationship with the supply and adequacy of the resources, the foundations of nursing for the quality of care and the participation of nurses in hospital affairs (Ellis *et al.*, 2006; Escobar-Aguilar *et al.*, 2013; Lake, 2002).

Mainz *et al.*, (2015) mention that quality and patient's safety are a priority for managers and administrators and that a favorable work environment is an important support factor for the quality and safety of hospitalized patients. They found that in Danish hospitals the participation of nurses in hospital affairs was at a low level and, in conclusion, they report that the nursing work environment provides support and an opportunity for improvement in magnet hospitals.

Based on what is previously described, the purpose of this study was to know the relationship that exists between rationed nursing care and the work environment of nursing professionals who work in a public health institution with a third level of attention

MATERIALS AND METHODS

The design of the study was descriptive and correlational (Burns y Grove, 2012). This design allowed us to describe the study variables as well as identify the interrelationship between two or more variables. In this study we aimed to determine the relationship between rationed nursing care and the nursing work environment. The population being studied consisted of nursing personnel from both sexes, assigned to the services of Gynecology, Obstetrics, Tocosurgery, Internal Medicine and General Surgery of a public health institution with third level attention in the Metropolitan Area of Monterrey, N.L. The size of the sample for nursing personnel was determined using the statistics package known as nQuery Advisor, Version 4.0, (Elashoff *et al.*, 2000) for a correlational analysis with .05 significance level, .20 determining factor (small to medium effect, according to Cohen, [1988]), with power of 90%, resulting in a sample size of 205 nurses (both genders). Based on the estimated size of the sample, the nursing personnel census in the previously mentioned services was taken into consideration.

The criterion for inclusion was permanent and temporary nursing personnel, with assigned patients and at least two months of work in the service, who accepted the invitation to

participate in this study out of their own will. Additionally, morning, afternoon and night shifts were considered and a pilot plan, in the categories of nursing technician, general nurse and bachelor in nursing. For the collection of information we used the implicit rationing survey for nursing care (Basel Extent of Rationing of Nursing Care), [BERNCA] designed by Schubert *et al*, (2008). For the use of the instrument, we had the author's authorization, who also authorized the translation of the instrument for its application in the Mexican population. It was necessary to translate from English to Spanish, performing two translations and a unified version was created based on the translators' opinions. At a later time, the instrument was translated to its original language (English) which, once again was translated from English to Spanish.

The survey contains 36 questions, divided into two sections. The first section includes the nursing personnel socio-demographic and labor data, with 18 questions, having open and multiple choice questions. Questions 16 to 18 measure the nursing personnel satisfaction in the current position, their work as nurses and team work. The range of response for these questions is of the Likert type, which ranges from high to low, where 5 = Very satisfied, 4 = Medium satisfaction, 3 = Satisfied, 2 = Unsatisfied, and 1 Very unsatisfied.

The second section, called "Rationed Nursing Care", corresponds to the elements of rationed nursing care given to the patient. This section is divided into five care elements and consists of 18 questions. The first care element, Daily Life Activities, includes six questions (1-6). Regarding the second element, Care and Support, it includes two questions (7-8). The third element of Care, Rehabilitation- Instruction-Education, consists of four questions (9-12). The fourth element of care, monitoring- safety, includes three questions (13-15). Finally, the fifth element of care, Documents, includes three questions (16-18).

The response scale is of the Likert type, which ranges from high to low, 5 = always, 4 = frequently, 3 = sometimes, 2 = rarely, and 1 = never. The response options are transformed into a dichotomic scale where options 4 and 5 are considered performed care, while options 1, 2 and 3 are considered rationed care. For the analysis of the data, indexes were performed with values from 0 to 100, where higher points corresponded to more care performed, and lower points to more rationed care. The survey of implicit rationing of nursing care has reported a Cronbach's Alpha of .93, and in this study it corresponded to .84, which is considered acceptable (Bruns & Grove, 2012).

For the measurement of the nursing practice environment, the Practice Environment Scale of the Nursing Work Index [PES-NWI] de Lake (2002) was used.

This instrument measures the knowledge and contributions that nursing personnel can offer inside the hospital, for the improvement of nursing care attention. For the purposes of this study, the Spanish version of Orts-Cortes *et al*, (2013) was used. The nursing work environment scale is divided into five factors. The first factor corresponds to the participation of nursing personnel in hospital affairs and consists of eight questions (5, 6, 11, 16, 18, 23, 25 and 29). The second factor corresponds to foundations of nursing for the quality of care and consists of nine questions (4, 15, 19, 20, 24, 27, 28, 31 and

32). The third factor corresponds to the supervisor's aptitude, leadership and support and includes four questions (3, 10, 14 & 22). The fourth factor corresponds to staffing and supply of resources, and includes four questions (1, 8, 9 & 12) and the fifth factor corresponds to relationships between nursing personnel and medical personnel and includes seven questions (2, 7, 13, 17, 21, 26 & 30).

The scale has a total of 32 questions and the response options are of the Likert type ranging from higher to lower, where 4=In agreement, 3=Somewhat in agreement, 2=Some disagreement and 1=In disagreement. This instrument has reported a Cronbach's Alpha of 0.84 and for this study it corresponded to .90, which is considered acceptable (Bruns & Grove, 2012). For the analysis of the data, indexes were carried out with values from 0 to 100, where the total of the Likert type responses with higher values correspond to a more favorable nursing work environment.

This study complied with the provisions established in the General Law of Health Regarding Research for Health (Ministry of Health, 1987). This Law establishes that to perform Health Research several ethical aspects should be considered in order to guarantee the dignity and wellbeing of the participants in this research.

RESULTS

The average age of nursing personnel corresponded to 27.4 years ($SD=7.9$). The predominant gender was female with 77.6%. The shift was the night shift with 39.5%, followed by the morning shift with 22.4%. The category that prevailed was that of nursing technician with 53.2%, followed by bachelor in nursing with 34.1%. The service with the highest proportion of participants was tocosurgery with 30.7% followed by general surgery with 30.2%.

The work characteristics of nursing personnel regarding seniority in the institution and work experience had similar results. The average was 7.3 ($SD=7.0$) y 7.9 ($SD=7.1$) respectively. The number of patients assigned was an average of 7.6 ($SD=4.6$) and the number of hours worked per day showed an average of 10.9 ($SD=2.9$).

Table 1 shows the general indexes of the rationed care elements. It was found that the element with the highest proportion of rationed care given was monitoring and safety, with an average of 85.6 ($SD=14.8$) and a median of 91.6. The greater rationed care was daily life activities with an average of 59.9 ($SD=16.5$) and median of 62.5.

Table 1 General Index based on the implicit rationing elements of nursing care.

General Indexes	Average	Median	SD	Confidence Interval 95%	
				Lower Limit	Higher Limit
General Index of care elements	72.8	73.3	12.1	71.1	74.5
Daily life activities	59.9	62.5	16.5	57.6	62.1
Care and Support	67.3	75.0	22.4	64.2	70.4
Rehabilitation, Instruction and Education	66.3	68.7	20.9	63.4	69.2
Monitoring and Safety	85.6	91.6	14.8	83.5	87.6
Documents	85.0	91.6	16.7	82.6	87.3

Note: BERNCA; SD = Standard Deviation

Table 2 shows the General Indexes of the factors that contribute to nursing work environment. It can be observed that the factor with the greatest contribution was "Nursing Foundations for the Quality of Care" with an average of 67.6 ($SD=17.0$) and a median of 66.6. The factor with the lowest contribution to the work environment was staffing and supply of resources with an average of 52.4 ($SD=22.4$) and a median of 50.0.

Table 2 General Index based on the factors that contribute to the nursing work environment.

General Index	Average	Median	SD	Confidence Interval 95%	
				Lower Limit	Higher Limit
General Index of the factors of work environment	60.6	62.4	14.7	58.5	62.6
Participation of nursing personnel in hospital affairs	58.5	58.3	17.3	56.1	60.9
Foundations of nursing for the quality of care	67.6	66.6	17.0	65.3	70.0
Aptitude, leadership and support from the supervisor	64.3	66.6	23.8	61.0	67.6
Staffing and supply of resources	52.4	50.0	22.4	49.3	55.5
Relationships between nursing personnel and medical personnel	60.0	61.9	19.5	57.3	62.7

Note: PES-NWI; SD = Standard Deviation

Table 3 shows the relationship that exists between staffing and supply of resources with daily life activities, care and support, and rehabilitation, instruction and education, where, when the Spearman Correlation test is applied, it is observed that higher staffing and supply of resources correspond to greater rationed care in daily life activities, care and support, and rehabilitation, instruction and education and total BERNCA Index.

Table 3 Relationship between the staffing factor and supply of resources and the elements of implicit rationing of nursing care.

BERNCA/PES-NWI Index	Index of staffing and supply of resources
Index of daily life activities	.158*
Index of Care and Support	.139*
Index of Rehabilitation, Instruction and Education	.247**
Total BERNCA Index	.244**

Note: BERNCA; PES-NWI
 ** .01 Considerably significant
 * .05 Significant

The Chi Square test was applied and in Table 4 it can be observed that the nursing technician is the one who performs more monitoring and safety ($\chi^2= 10.049$, $p= .007$).

Table 4 Monitoring and Safety based on Category.

Category	ni	Average	Median	SD	χ^2	p
Nursing Technician	109	88.9	91.6	11.5	10.049	.007
General Nurse	26	80.1	83.3	17.3		
Bachelor in Nursing	70	82.5	83.3	17.1		

Note: BERNCA; ni = sample, SD = Standard Deviation
 χ^2 = Chi square, p =level of significance

Table 5 shows that the General Nurse is the one who applies most the Nursing Foundations for the Quality of Care ($\chi^2= 6.778$, $p= .034$).

Table 5 Foundations of Nursing for the Quality of Care, based on category

Category	ni	Average	Median	SD	χ^2	p
Nursing Technician	109	68.9	66.6	17.3	6.778	.034
General Nurse	26	72.6	72.2	14.3		
Bachelor in Nursing	70	63.8	69.9	16.7		

Note: BERNCA; ni = sample, SD = standard deviation
 χ^2 = Chi square, p =level of significance

Table 6 shows that the service that performs more daily life activities is general surgery ($\chi^2= 30.132$, $p= .001$).

Table 6 Daily Life Activities based on service

Service	ni	Average	Median	SD	χ^2	p
Gynecology	14	61.0	60.4	12.4	30.132	.001
Obstetrics	21	60.9	58.3	19.2		
Tocosurgery	63	50.6	50.0	17.6		
Internal Medicine	45	63.3	62.5	15.7		
General Surgery	62	66.2	64.5	11.2		

Note: BERNCA; ni = sample, SD = Standard Deviation
 χ^2 = Chi square, p =level of significance

Table 7 shows that the service that performs more rehabilitation, instruction and education was Internal Medicine ($\chi^2= 19.206$, $p= .001$).

Table 7 Rehabilitation, Instruction and Education based on service

Service	ni	Average	Median	SD	χ^2	p
Gynecology	14	62.0	62.5	19.2	19.206	.001
Obstetrics	21	66.0	56.2	23.5		
Tocosurgery	63	57.9	50.0	24.3		
Internal Medicine	45	74.7	75.0	17.4		
General Surgery	62	69.3	68.7	15.6		

Note: BERNCA; ni = sample, SD = Standard Deviation
 χ^2 = Chi square, p =level of significance

DISCUSSION

The results of this study allowed us to determine the relationship between the elements of rationed nursing care and the factors that contribute to the work environment. The index with higher rationed care was daily life activities. This result coincides with that of Kalisch & Aebersold (2010), who point out that nursing personnel are interrupted by colleagues or patients every six minutes and for failures in the work system, once every hour. This causes nursing tasks to seldom be finished before moving on to perform another activity.

The factor with the highest contribution to the nursing work environment was foundations of nursing for the quality of care. These results coincide with those of Escobar *et al.*, (2013) & Ellis *et al.*, (2006), who point out that nursing personnel have more professional development and progress.

It was also found that to a greater staffing and supply of resources, corresponds a higher level of daily life activities, care and support, rehabilitation, instruction and education. This result coincides with that of Escobar *et al.* (2013), who point out that greater staffing and supply of resources correspond to a higher compliance with care activities.

The category of nursing technician is the one that performs more monitoring and safety care. This can be due to the fact

that the nursing technician category is the one that is closer to patient care. The general nurse applies more foundations of nursing. This can be attributed to the fact that the general nurse perceives that continuous education for nursing personnel is essential in hospital institutions.

More daily life activities are performed in the general surgery service when compared to other services. This may be due to the fact that this service performs multiple tasks and activities which are essential for the care demands of the patient.

The Internal Medicine service performs more rehabilitation, instruction and education. This can be attributed to the fact that this service offers more care, and the nursing personnel considers education of the patient as important in order to perform comprehensive care.

CONCLUSIONS

According to nursing personnel, it was found that the greater element of rationed care was daily life activities and the lowest rationed care was monitoring and safety.

Nursing personnel identified that the factor with the greatest contribution to the work environment was foundations of nursing for the quality of care and the factor with the lowest contribution to the work environment was staffing and the supply of resources.

When there is greater staffing and supply of resources, nursing personnel perform more daily life activities, care and support, rehabilitation, instruction and education.

It was identified that the nursing technician performs more monitoring and safety care. And the general nurse identified the factor that contributes the most to the work environment to be foundations of nursing for the quality of care.

General Surgery performs the largest number of daily life activities and internal medicine performs more rehabilitation, instruction and education.

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How to cite this article:

Rodríguez-Amaya, VN et al.2017, *Implicit Rationing of Nursing Care And Its Relationship With The Work Environment*. *Int J Recent Sci Res*. 8(12), pp. 22187-22192. DOI: <http://dx.doi.org/10.24327/ijrsr.2017.0812.1218>
